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Case Series

# Rehabilitation with Dental Implant After Cancer Treatment. Is it Possible: A Case Series

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## Abstract

Nowadays dental is considered the first treatment option to restore missing teeth. Several studies agreed about the high success rate regarding modern dental implants in the maxilla and mandible. As well as many studies showed improvement in the quality of life after dental implants regarding both esthetics and function. Cancer fighters go on a long journey of treatment to cure the cancer. The treatment might be chemotherapy, radiotherapy, or hormonal or combination. After that journey, some patients might need to restore the missing teeth to improve their quality of life. Unfortunately, the bone healing capacity may affected among those patients due to impaired osteoblast and osteoclast function. The osseointegration process is affected due to the limited blood supply associated with endarteritis. Xerostomia and soft tissue fragility are other challenges to the healing process. In this study total of three cases will be discussed regarding dental implants after they finish the treatment and cured for cancer.

**Conclusion:** Its possible to place dental implants after reviewing the current patient medical condition and bone capacity for healing.

**Keywords:** Cancer, Chemotherapy, Radiotherapy

## Introduction

Different designs of dental implant prostheses are used to restore missing tooth/teeth to improve the mastication and the appearance of the patient. Such promising treatment had a great impact on the quality of life of patients around the world [1]. Patients during or after the treatment of cancer might lose some of their teeth. Therefore, the use of a dental implant might be one of the suggested treatment plans to restore the missing teeth. Many challenges may face the treatment with dental implants after radiotherapy such as; a decrease in the capacity of the bone to heal after osteotomy, a decrease in the blood supply, xerostomia, and soft tissue friability. Five-year survival rate reported by Wagner et al. for the implants in the mandible with a dose of 60-Gy was 97.9%. They suggested that the dental implants can be placed with 1-2 years of radiotherapy of the dose between 50-60 Gy to avoid osteoradionecrosis [2]. Granstrom et al. suggested a longer healing process to allow for osseointegration to take place and the implant loading to be delayed to 4- 8 months [3]. Moreover, longer implants are recommended to increase the chance of the healing process. Due to the soft tissue condition, the implant-fixed prosthesis is a more suitable option over the removable prosthesis to avoid soft tissue ulceration.

On the other hand, chemotherapy may lead to stomatoxicity as a result of myelosuppression-induced leukopenia and thrombocytopenia. Accordingly, bleeding and fungal and bacterial infection will be the signs and symptoms of those patients. Bone formation is dimensioned as an indirect effect of the reduced blood supply. CTX test is used to measure the carboxy-terminal collagen cross-links (CTX) in serum as an indicator for bone resorption [4]. High risk of osteonecrosis associated when the CTX level is less than 100 pg/ml.

## Case 1

A 53-year-old female patient with a history of preventive mastectomy due to a benign tumor and Malignant rectal cancer 5 years ago. She went for chemotherapy and hormonal therapy five years ago. The patient is now fully cured of the cancer and is on annual follow-up with her oncologist. The patient presented to the oral implantology clinic seeking rehabilitation of her missing teeth to improve mastication. On examination, #36,37.46 was missing and the patient could not chew on both sides (Figure 1). After careful examination and improvement of the patient's oral hygiene, a dental implant is planned to be placed on the lower right side first under local anesthesia. Dental implants were placed according to the guidelines to ensure good outcomes. Accordingly, Astra tech implant EV@ 4.0*9 mm was placed as a single stage to restore missing #46. Four months later implant was loaded with a screw-retained crown (Figure 2,3). After 6 months of successful osseointegration, implants were decided to be placed on the other side. Two B and B Dura – VIT. 3P was placed as a single stage to restore missing #36,37 (4.0 * 8 mm) (Figure 4,5). Post-operative instruction was given to the patient. As well as Augmentin 1gm was prescribed twice a day for 7 days, painkillers, and chlorohexidine mouthwash for the next 10 days.

**Figure 1:** Pre-operative X-rays

**Figure 2:** Post-operative #46.

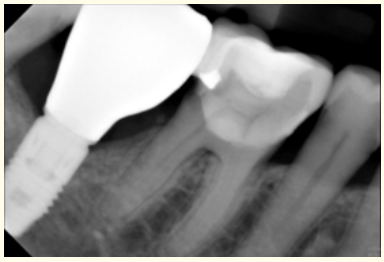

**Figure 3:** One-year follow-up after implant loading

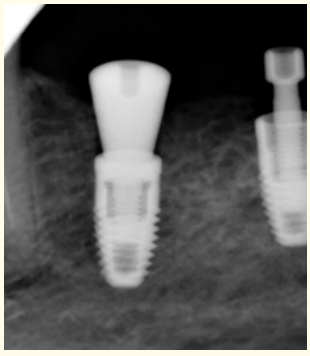

**Figure 4:** Postoperative #36,37

**Figure 5:** One year after implant loading.

## Case 2

A 54-year-old female patient was referred to the dental implant clinic to restore her missing teeth (Figure 6). The patient had a history of colon cancer and treated 6 years ago. The patient was under chemotherapy and radiotherapy. The patient's CTX level was more than 100 pg/ml before the implant placement time. Clinical and radiographic examination was done to evaluate the patient case. The decision was made to place dental implants in the area of #36,37. Patients were instructed to start with chlorhexidine mouthwash the night before the surgery. Pre-operative prophylactic antibiotic was prescribed to the patient. Two implants were placed in the area of #36,37 (Struman BLT @ 4.1*10 mm) as a single stage with-

out bone graft (Figure 7). Primary stability was more than 35Ncm and closed with black silk suture. Post operative instruction and medication was giving to the patient. Two weeks later suture was removed and the healing looks good. six months later both implants were successfully osseointegrated and restored (Figure 8).

**Figure 6:** Pre-operative X-ray.

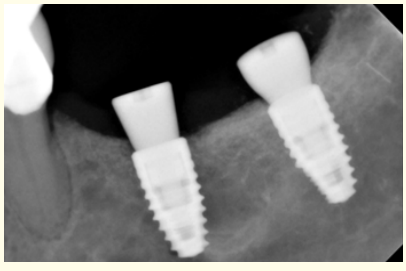

**Figure 7:** Post-immediate x-ray.

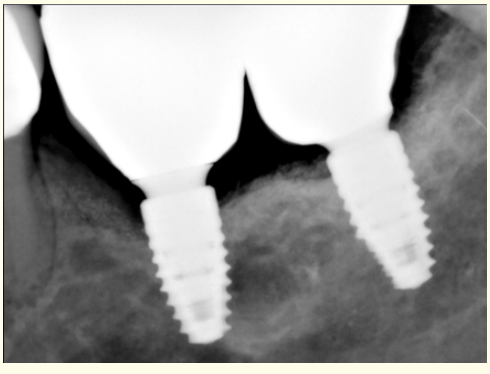

**Figure 8:** One-year follow-up.

### Case 3

A 43-year-old female patient presented to the oral implantology clinic to restore her missing teeth. Up on examination, multiple missing teeth need dental implants. The patient had a history of dental implants 5 years ago in the area# 15,16. The patient's medical history reviewed with patient and the patient had a history of chemotherapy and radiotherapy after breast cancer two years ago. Clinical and radiographical examination was done. Accordingly, the treatment plan was to extract the remaining roots #35, 37 and immediate placement of the implant in the same area. The patient was advised to do the CTX level and it was 30 pg/ml which is considered a very high risk of developing osteonecrosis. The patient informed me that it's not recommended to place dental implants in the meantime. So, only a removable partial denture was constructed for this patient to facilitate the mastication process for her. The patient was advised to repeat the CTX level after one year to check the possibility of implant placement in the future.

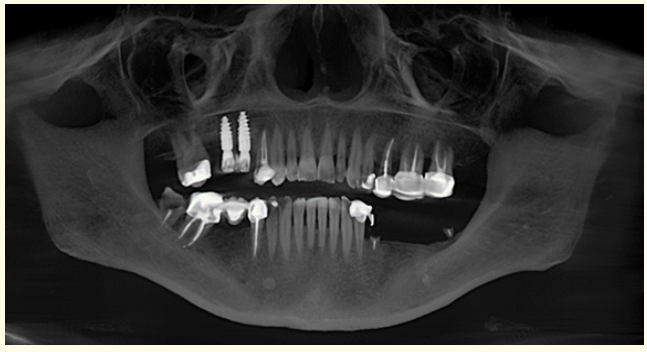

**Figure 9:** Pre-operative X-ray.

## Conclusion

No doubt dental implant is the best available treatment option to replace missing tooth/teeth to improve a patient's quality of life. This case series showed that it is possible to have a successful osseointegrated dental implant in the patient after chemotherapy and radiotherapy without any complications. Those patients might be conditionally contraindicated for the dental implants until their conditions get better. More investigations and future studies are needed to draw guidelines regarding placing dental implants after cancer treatment.

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